Claims

1. Method in a multi-layer web formation section, the method comprising the following stages:

- at least two successive wire units (300, 310, 320) are formed in such a way that the two successive wire units have one wire (11, 41, 51) in common,
- a pulp suspension jet is supplied by a first headbox (100) to the forward end of the first wire unit (300),
- a first partial web (W1) is formed in the first wire unit (300),
- the wire (11, 41) of the first wire unit (300) is guided through the second wire unit (310) in such a way that said wire (11, 41) of the first wire unit (300) forms a second wire in the two-wire zone of the second wire unit (310),
- the first partial web (W1) formed in the first wire unit (300) is guided on said wire (11, 41) of the first wire unit (300) to the second wire unit (310),
- a new pulp layer is supplied by a second headbox (110) to the forward end of the second wire unit (310) atop the first partial web (W1),
- at least two successive dewatering zones (Z1b, Z2b) are formed in the two-wire stretch of the second wire unit (310),
- the latter second dewatering zone (Z2b) of the two-wire stretch of the second wire unit (310) is formed by fixed dewatering lists (210b), which are placed against one side of the two-wire stretch in the cross machine direction and between which there are gaps (220b), whereby the fibre pulp travelling in between the formation wires (11, 21, 41, 61, 41, 51) of the two-wire stretch is subjected to pulsating dewatering by the fixed dewatering lists (210b), and by underpressure (Pb) in the area of the fixed dewatering lists (210b),

characterized in that

- the first dewatering zone (Z1b) of the two-wire stretch of the second wire unit (310) is formed by at least one fixed first formation shoe (200b), which is located at the forward end of the two-wire stretch and which has a curved cap (201), which is placed against that side of the two-wire stretch, to which a new pulp layer is supplied by the second headbox (110), the cap being provided

with openings (202) extending through it, and an under-pressure (P) affecting through the openings (202) of the cap (201), which openings (202) are formed by holes or by gaps essentially in the lengthwise direction of the machine, whereby the fibre pulp travelling in between the formation wires (11, 21, 41, 61, 41, 51) of the two-wire stretch is subjected to non-pulsating dewatering in an area following after the leading edge (203) of the first formation shoe (200b).

2. Method according to claim 1, **characterized** in that in the second dewatering zone (Z2b) of the two-wire stretch of the second wire unit (310) dewatering lists (230b) are formed, which can be loaded in a controlled manner and which are located on the opposite side of the two-wire stretch in relation to the fixed dewatering lists (210b), at the gaps (220b) between the fixed dewatering lists (210b).

3. Method according to claim 1 or 2, **characterized** in that the first wire unit (300) is formed as a fourdrinier wire unit, to the forward end of which a first headbox (100) supplies a pulp suspension jet on to the fourdrinier wire (11).

4. Method according to claim 3, **characterized** in that in the fourdrinier wire unit (300) two successive dewatering zones (Z1a, Z2a) are formed.

5. Method according to claim 4, **characterized** in that the first dewatering zone (Z1a) of the fourdrinier wire unit (300) is formed at the beginning of the fourdrinier wire unit (300) by a fixed second formation shoe (200a), which is located at the impact point of the pulp suspension jet supplied by the first headbox (100) and which has a curved cap (201), which is placed against the inner surface of the fourdrinier wire (11) and is provided with openings (202) extending through the cap (201), and an under-pressure (P) affecting through the cap's (201) openings (202), whereby the fibre pulp travelling on the fourdrinier wire (11) is subjected to non-pulsating dewatering in an area following after the leading edge (203) of the second formation shoe (200a).

6. Method according to claim 5, **characterized** in that the second dewatering zone (Z2a) of the fourdrinier wire unit (300) is formed by a fixed fourth formation shoe (200d), which is located at the output end of the fourdrinier wire unit (300) at the point of impact of the pulp suspension jet of the second headbox (110) and which has a curved cap (201) placed against the inner surface of the fourdrinier wire (11) and provided with openings (202) extending through the cap (201), and an under-pressure (P) affecting through the cap's (201) openings (202), whereby the fibre pulp travelling on the fourdrinier wire (11) is subjected to non-pulsating dewatering in an area following after the leading edge (203) of the third formation shoe (200d).

7. Method according to claim 1, **characterized** in that a first wire unit (300) is formed as a wire unit equipped with a two-wire stretch, and a first headbox (100) supplies a pulp suspension jet to the forward end of the first wire unit into a first jaw (G1) formed by the formation wires (31, 41, 11, 81).

8. Method according to claim 7, **characterized** in that two successive dewatering zones (Z1a, Z2a) are formed in the two-wire stretch of the first wire unit (300).

9. Method according to claim 8, **characterized** in that the first dewatering zone (Z1a) of the first wire unit (300) is formed at the beginning of the two-wire stretch of the first wire unit (300) by a fixed second formation shoe (200a), which is placed against one side of the two-wire stretch and which has a curved cap (201) provided with openings (202) extending through the cap (201), and an under-pressure (P) affecting through the cap's (201) openings (202), whereby the fibre pulp travelling in between the formation wires (31, 41, 11, 81) is subjected to non-pulsating dewatering in an area following after the leading edge (203) of the second formation shoe (200a).

10. Method according to claim 8, **characterized** in that the first dewatering zone (Z1a) of the first wire unit (300) is formed at the beginning of the two-wire stretch of

the first wire unit (300) by two successive fixed second formation shoes (200a1, 200a2), which are located on opposite sides of the two-wire stretch and which have a curved cap (201) provided with openings (202) extending through the cap (201), and an under-pressure (P) affecting through the cap's (201) openings (202), whereby the fibre pulp travelling in between the formation wires (11, 81) is subjected to non-pulsating dewatering in the area of the formation shoes (200a1, 200a2).

11. Method according to claim 9 or 10, **characterized** in that a later second dewatering zone (Z2a) of the two-wire stretch of the first wire unit (300) is formed by fixed dewatering lists (210a), which are placed against one side of the two-wire stretch in the cross machine direction and which in between them have gaps (220a), whereby the fibre pulp travelling in between the formation wires (31, 41, 11, 81) of the two-wire stretch is subjected to pulsating dewatering by the fixed dewatering lists (210a) and by the under-pressure (Pa) in the area of the fixed dewatering lists (210a).

12. Method according to any claim 11, **characterized** in that in the second dewatering zone (Z2a) of the two-wire stretch of the first wire unit (300) dewatering lists (230a) are formed, which can be loaded in a controlled manner and which are located on the opposite side of the two-wire stretch in relation to the fixed dewatering lists (210a), at the gaps (220a) between the fixed dewatering lists (210a).

13. Method according to any claim 1-12, **characterized** in that non-pulsating dewatering is performed by a formation shoe (200a, 200b, 200d, 200a1, 200a2), where the open surface area defined by the openings (202) of its cap (201) is 50-90 % of the total surface area of the cap.

14. Method according to any claim 1-13, **characterized** in that non-pulsating dewatering is performed by a formation shoe (200a, 200b, 200d, 200a1, 200a2), where the openings (202) extending through its cap (201) are located obliquely against the travelling direction of the formation wire (11, 21, 31, 51, 61) in such a way that the

angle (α) between the central axes of the openings (202) and a tangent to the cap's (201) outer surface is 30-60 degrees.

15. Method according to any claim 1-14, **characterized** in that non-pulsating dewatering is performed by a formation shoe (200a, 200b, 200d, 200a1, 200a2), where its cap's (31) radius of curvature (R) is 1-20 m.

16. Method according to any claim 1-15, **characterized** in that non-pulsating dewatering is performed by a formation shoe (200a, 200b, 200d, 200a1, 200a2) in such a way that the overlap angle of the formation wire (11, 21, 31, 51, 61, 81) travelling over the formation shoe is 3-45 degrees, preferably 5-30 degrees, in the area of the cap (201) of the formation shoe.

17. Multi-layer web formation section comprising:

- at least two successive wire units (300, 310, 320) having one wire (11, 41) in common,
- a first wire unit (300), which has a forward end and an output end and wherein a first partial web (W1) is formed,
- a first headbox (100), which is used to supply a pulp suspension jet to the forward end of the first wire unit (300),
- a second wire unit (310), which is equipped with a two-wire stretch and where the two-wire stretch has a forward end, where the formation wires (11, 21, 41, 61, 41, 51) form a closing jaw (G2,), and an output end, where the formation wires (11, 21, 41, 61, 41, 51) are separated from one another, whereby the first partial web (W1) formed in the first wire unit (300) is guided on the formation wire (11, 41) of the first wire unit (300) to the two-wire stretch of the second wire unit (310),
- a second headbox (110), which is located at the forward end of the two-wire stretch of the second wire unit (310) and which is used to supply a new pulp layer atop the first partial web (W1),
- at least two successive dewatering zones (Z1b, Z2b) in the two-wire stretch of the second wire unit (310),

- a later second dewatering zone (Z2b) of the two-wire stretch of the second wire unit (310) is formed by fixed dewatering lists (210b), which are placed against one side of the two-wire stretch in the cross machine direction and which in between them have gaps (220b), whereby the fibre pulp travelling in between the formation wires (11, 21, 41,61, 41, 51) of the two-wire stretch is subjected to pulsating dewatering by the fixed dewatering lists (210b) and by under-pressure (Pb) in the area of the fixed dewatering lists (210b),

characterized in that

- the first dewatering zone (Z1b) of the two-wire stretch of the second wire unit (310) is formed by at least one fixed first formation shoe (200b), which is located at the forward end of the two-wire stretch and which has a curved cap (201) placed against that side of the two-wire stretch, to which the new pulp layer is supplied by the second headbox (110), and provided with openings (202) extending through the cap (201) and an under-pressure (P) affecting through the cap's (201) openings (202), which openings (202) are formed by holes or by gaps essentially in the lengthwise direction of the machine, whereby the fibre pulp travelling in between the formation wires (11, 21, 41, 61, 41, 51) of the two-wire stretch is subjected to non-pulsating dewatering in an area following after the leading edge (203) of the first formation shoe (200a).

18. Formation section according to claim 17, **characterized** in that the second dewatering zone (Z2b) of the second wire unit (310) also comprises dewatering lists (230b), which can be loaded in a controlled manner and which are located on the opposite side of the two-wire stretch in relation to the fixed dewatering lists (210b), at the gaps (220b) between the fixed dewatering lists (210b).

19. Formation section according to claim 17 or 18, **characterized** in that the first wire unit (300) is a fourdrinier wire unit, to the forward end of which a first headbox (100) supplies a pulp suspension jet on to the fourdrinier wire (11).

20. Formation section according to claim 19, **characterized** in that the fourdrinier wire unit (300) has two successive dewatering zones (Z1a, Z2a).

21. Formation section according to claim 20, **characterized** in that the first dewatering zone (Z1a) of the fourdrinier wire unit (300) is formed by a fixed second formation shoe (200a), which is located at the beginning of the fourdrinier wire unit (300) at the point of impact of the pulp suspension jet supplied by the first headbox (100) and which has a curved cap (201) placed against the inner surface of the fourdrinier wire (11) and provided with openings (202) extending through the cap (201), and an under-pressure (P) affecting through the cap's (201) openings (202), whereby the fibre pulp travelling on the fourdrinier wire (11) is subjected to non-pulsating dewatering in an area following after the leading edge (203) of the second formation shoe (200a).

22. Formation section according to claim 21, **characterized** in that the second dewatering zone (Z2a) of the fourdrinier wire unit (300) is formed by a fixed third formation shoe (200d), which is located at the output end of the fourdrinier wire unit (300) at the point of impact of the pulp suspension jet of the second headbox (110) and which has a curved cap (201) placed against an inner surface of the fourdrinier wire (11) and provided with openings (202) extending through the cap (201), and an under-pressure (P) affecting through the cap's (201) openings (202), whereby the fibre pulp travelling on the fourdrinier wire (11) is subjected to non-pulsating dewatering in an area following after the leading edge (203) of the third formation shoe (200d).

23. Formation section according to claim 17, **characterized** in that the first wire unit (300) is a wire unit equipped with a two-wire stretch and to the forward end of which a first headbox (100) supplies a pulp suspension jet into a first jaw (G1) formed by formation wires (31, 41, 11, 81).

24. Formation section according to claim 23, **characterized** in that there are two successive dewatering zones (Z1a, Z2a) in the two-wire stretch of the first wire unit (300).

25. Formation section according to claim 24, **characterized** in that the first dewatering zone (Z1a) of the first wire unit (300) is formed by a fixed second formation shoe (200a), which is located at the beginning of the two-wire stretch of the first wire unit (300) on one side of the two-wire stretch and which has a curved cap (201) provided with openings (202) extending through the cap (201), and an under-pressure (P) affecting through the cap's (201) openings (202), whereby the fibre pulp travelling in between the wires (31, 41) is subjected to non-pulsating dewatering in an area following after the leading edge (203) of the second formation shoe (200a).

26. Formation section according to claim 24, **characterized** in that the first dewatering zone (Z1a) of the first wire unit (300) is formed by two successive fixed second formation shoes (200a1, 200a2), which are located at the beginning of the two-wire stretch of the first wire unit (300) on opposite sides of the two-wire stretch and which have a curved cap (201) provided with openings (202) extending through the cap (201), and an under-pressure (P) affecting through the cap's (201) openings (202), whereby the fibre pulp travelling in between the formation wires (11, 81) is subjected to non-pulsating dewatering in the area of the formation shoes (200a1, 200a2).

27. Formation section according to claim 25 or 26, **characterized** in that the later second dewatering zone (Z2a) of the two-wire stretch of the first wire unit (300) is formed by fixed dewatering lists (210a), which are placed against one side of the two-wire stretch in the cross machine direction and which between them have gaps (220a), whereby the fibre pulp travelling in between the formation wires (31, 41) of the two-wire stretch is subjected to pulsating dewatering by the fixed dewatering lists (210a) and by the under-pressure (Pa) in the area of the fixed dewatering lists (210a).

28. Formation section according to claim 27, **characterized** in that the second dewatering zone (Z2a) of the first wire unit (300) also comprises dewatering lists (230a), which can be loaded in a controlled manner and which are located on the opposite side of the two-wire stretch in relation to the fixed dewatering lists (210a), at the gaps (220a) between the fixed dewatering lists (210a).

29. Formation section according to any claim 17-28, **characterized** in that the open surface area defined by the openings (202) of the cap (201) of the formation shoe (200a, 200b, 200d, 200a1, 200a2) performing non-pulsating dewatering is 50-90 % of the total surface area of the cap.

30. Formation section according to any claim 17-29, **characterized** in that the holes (202) extending through the cap (201) of the formation shoe (200a, 200b, 200d, 200a1, 200a2) performing non-pulsating dewatering are located obliquely against the travelling direction of the formation wire (11, 21, 31, 51, 61, 11, 81) in such a way that the angle (α) between the central axes of the holes (202) and a tangent to the outer surface of the cap (201) is 30-60 degrees.

31. Formation section according to any claim 17-30, **characterized** in that the radius of curvature (R) of the cap (31) of the formation shoe (200a, 200b, 200d, 200a1, 200a2) performing non-pulsating dewatering is 1-20 m.

32. Formation section according to any claim 17-31, **characterized** in that the overlap angle of the formation wire (11, 21, 31, 51, 61) travelling over the formation shoe (200a, 200b, 200d, 200a1, 200a2) performing non-pulsating dewatering is 3-45 degrees, preferably 5-30 degrees, in the area of the cap (201) of the formation shoe.